Claims

[c1]   1. A method for calculating mass scores of calcium deposits, the method comprising:

obtaining patient image data;

identifying calcium plaque in said patient image data, wherein said calcium plaque is associated with a plurality of discrete patient pixel elements and wherein each of said patient pixel elements includes a patient pixel value expressed in Hounsfield units;

converting said patient pixel values into patient density values using a calibration curve equation; and

outputting said patient density values.

[c2]   2. The method of claim 1 wherein said obtaining patient image data includes obtaining patient image data using a computed tomography imaging system.

[c3]   3. The method of claim 1 further comprising:

summing said patient density values resulting in a total mass score; and

outputting said total mass score.

[c4]   4. The method of claim 3 wherein said total mass score includes said patient density values for one vessel within a heart.

[c5]   5. The method of claim 3 wherein said total mass score includes said patient density values for all vessels within a heart.

[c6]   6. The method of claim 1 wherein said identifying includes:

manually selecting said discrete patient pixel elements containing calcium plaque; and

highlighting said patient pixel elements that meet a preselected threshold criteria and a preselected connectivity criteria.

[c7]   7. The method of claim 6 wherein said preselected threshold criteria includes patient pixel elements with patient pixel values measuring 130 Hounsfield units or greater.

[c8]   8. The method of claim 1 wherein said calibration curve equation is

precomputed.

[c9]   9. The method of claim 1 further comprising precomputing said calibration
curve equation, wherein said precomputing includes:
obtaining phantom image data associated with a plurality of discrete phantom
pixel elements corresponding to a calcium insert of known density in a
phantom, wherein each of said phantom pixel elements includes a phantom
pixel value expressed in Hounsfield units;
graphing said phantom image data against said known density of said calcium
insert; and
developing said calibration curve equation for computing said patient density
values in response to said patient pixel values.

[c10]   10. The method of claim 9 wherein said phantom includes a poly phantom and
a calibration phantom.

[c11]   11. The method of claim 10 wherein said poly phantom approximates a medium
sized patient.

[c12]   12. The method of claim 10 wherein said poly phantom approximates a large
sized patient.

[c13]   13. The method of claim 10 wherein said calibration phantom includes three
calcium inserts of known density.

[c14]   14. The method of claim 13 wherein said calcium inserts of known density are
50, 100 and 200 milligrams per cubic centimeter.

[c15]   15. The method of claim 9 wherein said phantom is an anthropomorphic cardiac
phantom body including calcium inserts of known density.

[c16]   16. A method for calculating mass scores of calcium deposits, the method
comprising:
creating a calibration curve equation, wherein said creating includes:
obtaining phantom image data associated with a plurality of discrete phantom
pixel elements corresponding to a calcium insert of known density in a
phantom, wherein each of said phantom pixel elements includes a phantom

pixel value expressed in Hounsfield units;

graphing said phantom image data against said known density of said calcium insert; and

developing said calibration curve equation for computing said patient density values in response to patient pixel values;

obtaining patient image data;

identifying calcium plaque in said patient image data, wherein said calcium plaque is associated with a plurality of discrete patient pixel elements and wherein each of said patient pixel elements includes a said patient pixel value expressed in Hounsfield units;

converting said patient pixel values into patient density values using said calibration curve equation; and

outputting said patient density values.

[c17]   17. A system for calculating mass scores of calcium deposits, the system comprising:

an imaging system;

an object disposed so as to be communicated with said imaging system, wherein said imaging system generates image data responsive to said object; and

a processing device in communication with said imaging system including software to implement the method comprising:

obtaining said image data;

identifying calcium plaque in said image data, wherein said calcium plaque is associated with a plurality of discrete pixel elements and wherein each of said pixel elements includes a pixel value expressed in Hounsfield units;

converting said pixel values into density values using a calibration curve equation; and

outputting said density values.

[c18]   18. The system of claim 17 wherein said object is a patient.

[c19]   19. The system of claim 17 wherein said imaging system is a computed tomography imaging system.

[c20]   20. The system of claim 17 wherein said imaging system and said processing device are physically located in the same geographic location.

[c21]   21. The system of claim 17 wherein said imaging system and said processing device are physically located in different geographic locations.

[c22]   22. The system of claim 17 wherein said processing device is in communication with said imaging system over a network.

[c23]   23. The system of claim 22 wherein said network is the Internet.

[c24]   24. A computer program product for calculating mass scores of calcium deposits, the product comprising:
a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for:
obtaining patient image data;
identifying calcium plaque in said patient image data, wherein said calcium plaque is associated with a plurality of discrete patient pixel elements and wherein each of said patient pixel elements includes a patient pixel value expressed in Hounsfield units;
converting said patient pixel values into patient density values using a calibration curve equation; and
outputting said patient density value.

[c25]
         25. A computer program product for calculating mass scores of calcium deposits, the product comprising:
a storage medium readable by a processing circuit and storing instructions for execution by the processing circuit for:
creating a calibration curve equation, wherein said creating includes:
obtaining phantom image data associated with a plurality of discrete phantom pixel elements corresponding to a calcium insert of known density in a phantom, wherein each of said phantom pixel elements includes a phantom pixel value expressed in Hounsfield units;
graphing said phantom image data against said known density of said calcium insert; and

developing said calibration curve equation for computing said patient density values in response to patient pixel values;

obtaining patient image data;

identifying calcium plaque in said patient image data, wherein said calcium plaque is associated with a plurality of discrete patient pixel elements and wherein each of said patient pixel elements includes a said patient pixel value expressed in Hounsfield units;

converting said patient pixel values into patient density values using said calibration curve equation; and

outputting said patient density values.